ABSTRACT

An improved analog front end and methods for increasing the power efficiency of duplex signals on a transmission line are disclosed. The improved analog front end bifurcates a hybrid into a fixed portion and an adaptive portion. The adaptive portion combines a biquad and a summer to produce a filter transfer function suited to compensate for transmission line irregularities. A method for configuring a local transceiver to minimize power requirements at a remote transmitter is disclosed. Broadly the method entails, applying a transmit signal to a front end in the absence of a remote signal; optimizing the transmit signal power; recording the reflected transmit signal; applying an adaptive filter in response to transmission line irregularities; and controllably adjusting the adaptive filter to minimize the amplitude of the reflected version of the transmit signal in the receive path. A method for recovering a remotely generated signal is also disclosed. The method entails, applying a local transmit signal to the front end in the absence of a remote signal; recording a reflected version of the transmit signal in the receive path; controllably adjusting an adaptive portion of the front end to minimize the amplitude of the reflected version of the local transmit signal; and combining a scaled replica of the local transmit signal with a plurality of adaptive filter outputs to recover a remotely generated receive signal from the transmission line.